

REMARKS

This paper responds to the Office Action mailed on August 22, 2005.

Claim 48 is amended, no claims are canceled, and claims 50-56 are added; as a result, claims 45-56 are now pending in this application.

Support for new claims 50 and 51 can be found in the specification, for example, at page 8, lines 11-19 and FIGS. 7-8. The other new claims are fully supported by the specification. No new matter is believed proposed.

Information Disclosure Statement

Applicant submitted an a Supplemental Information Disclosure Statement and a 1449 Form on October 1, 2003. Applicant respectfully requests that initialed copy of the 1449 form be returned to Applicants' Representatives to indicate that the cited references have been considered by the Examiner.

§102 Rejection of the Claims

Claims 48 and 49 were rejected under 35 U.S.C. § 102(b) for anticipation by Marks et al. (U.S. 5,204,288, herein “Marks”). Applicant respectfully traverses as a *prima facie* case of anticipation has not been made.

It is well settled that anticipation requires the disclosure in a single prior art reference of each element of the claim. It is not enough, however, that the prior art reference discloses all the claimed elements in isolation. Rather, “[a]nticipation requires the presence in a single prior reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*” *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis added). “The identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); MPEP § 2131.

Claim 48 recites, in part, “wherein said plasma etching further comprises etching generally simultaneously with performing said deposition.” Applicant can not find this feature in Marks. The Office Action refers to col. 9, line 50 of Marks as teaching this element. Applicant

respectfully submits that reliance on the passage is misplaced. The sentence that spans col. 9, line 50 of Marks states

In a variation on this embodiment when silicon oxide comprises insulation layer 20a, the vapor being deposited to form layer 20a may be mixed with an etchant such as a fluorine species, e.g., a CF₄, C₂F₆, or NF₃ gas, so that an in situ etch of the less dense silicon oxide sidewalls of layer 20a will occur during the deposition.

There is no teaching in this passage of a *plasma etching* as recited in present claim 48. Moreover, this passage has no teaching of *plasma etching* being generally simultaneous with performing said deposition. As Marks fails to teach each and every element of claim 48 as arranged in the claim, applicant requests that the rejection of claim 48 and its dependent claim 49 be reconsidered and withdrawn.

§103 Rejection of the Claims

Claims 45-49 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kurosawa (U.S. 4,371,407) in view of Marks et al. Applicant respectfully traverses.

The Examiner has the burden under 35 U.S.C. § 103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 U.S.P.Q.2d (BNA) 1596, 1598 (Fed. Cir. 1988). In combining prior art references to construct a *prima facie* case, the Examiner must show some objective teaching in the prior art or some knowledge generally available to one of ordinary skill in the art that would lead an individual to combine the relevant teaching of the references. *Id.* The M.P.E.P. contains explicit direction to the Examiner that agrees with the *In re Fine* court:

In order for the Examiner to establish a *prima facie* case of obviousness, three base criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not

based on applicant' s disclosure. M.P.E.P. § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d (BNA) 1438 (Fed. Cir. 1991)).

The fact that the references can be combined or modified does not render the resultant combination obvious *unless* the prior art *also* suggests the desirability of the combination. *In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990); M.P.E.P. § 2143.01. That is, unless all three of the conditions described in M.P.E.P. § 2142 are met, a *prima facie* case of obviousness is not established, and rejection under 35 U.S.C. §103 is improper.

Claim 45 recites, in part, “performing a deposition of said material over said wafer in said site, wherein said deposition occurs at a greater rate within said site than above said features.” The Office Action admits that Kurosawa does not suggest “deposition occurs at a greater rate within said site than above said features” (Office Action page 3, first full paragraph, section (a)). The Office Action does not provide a reference to cure this defect in Kurosawa as a reference against the pending claims. Applicant respectfully traverses the single reference rejection under 35 U.S.C. § 103 since not all of the recited elements of the claims are found Kurosawa. Since all the elements of the claim are not found in the reference, Applicant assumes that the Examiner is taking official notice of the missing elements. Applicant respectfully objects to the taking of official notice with a single reference obviousness rejection and, pursuant to M.P.E.P. § 2144.03, Applicant respectfully traverses the assertion of Official Notice and requests that the Examiner cite references in support of this position.

The Office Action goes on to state that

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the deposition rate of Kurosawa by utilizing the claimed deposition rate because one would adjust the deposition rate because one would adjust any or all of such parameters as source power, flow rate, bias power to result in the most effective polymer deposition.

However, this is a conclusory statement of subjective belief and does not explain the reasoning by which the evidence of record supports making modification to the sole reference in the rejection of claim 45. The Office Action must provide specific, objective evidence of record for a finding of a suggestion or motivation to combine reference teachings and must explain the

reasoning by which the evidence is deemed to support such a finding. *In re Sang Su Lee*, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002). The provided reasoning lacks support of substantial, objective evidence of record. Further, the fact that sole reference can be modified does not render the resultant combination obvious unless the prior art suggests the desirability of the combination or modification. See, e.g., *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990); MPEP § 2143.01. Thus, it appears the rejection of claim 45 based only on Kuroswawa is based on either impermissible hindsight or on the Examiner's personal knowledge that is not of record.

In the event that the combination was made based on the Examiner's personal knowledge, Applicant assumes the Examiner is taking Official Notice to provide the motivation to modify Kuroswawa. Applicant respectfully traverses this taking of Official Notice and, pursuant to MPEP § 2144.03, Applicant respectfully requests that the Examiner cite references in support of this position or provide a personal affidavit.

Further, Marks does not cure the above defect of Kuroswawa as a reference against claim 45 as applicant can not find where the office action indicates that Marks teaches that said deposition occurs at a greater rate within said site than above said features. Accordingly, a combination does not teach all of the elements of claim 45.

Based at least on the above, Applicant submits that claim 45 is allowable over Kuroswawa and Marks, either alone or in combination.

The Office Action in support of a motivation to combine Kuroswawa with Marks in part (b) of the rejection states that

It would have been obvious to one with ordinary skill in the art to modify the process of Kuroswawa by utilizing a material in a site between metal features for the purpose of providing an etch resistance layer within the site being etched in a subsequent removal of the material, thereby avoiding an over-etch of the semiconductor material surrounding the site.

Applicant respectfully traverses this statement. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); MPEP § 2143. Kuroswawa does not teach or suggest a site between metal features on a wafer or having steps related to further processing of such a site. The Office Action relies on Marks to teach a

material 20b in a space between metal features. However, there is no reasonable expectation of success and there is no motivation to combine these references as they teach away from each other, especially in view of the examiner's comments. The material film 20b of Marks is planarized with layer 30a to form insulator layer 20d as shown in Figure 11 (col. 9, lines 30-44). Layer 20d covers the metal features 14 and 15. Accordingly, Marks does not etch layer 20d and hence does not teach etching of semiconductor material surrounding the site. Likewise, Kurosawa is silent with regard to etching surround a site between metal elements as admitted by the Office Action is does not provide material between metal elements.

The Office Action further defines the deposited material as the layer 4 of Kurosawa. However, Kurosawa does not teach or even suggest that layer 4 is deposited with a simultaneous etch step. That is, if layer 4 was deposited between the areas of layer 3 that will form the metal islands (Figure 3E), then Kurosawa would not form the structure shown in its Figure 3E. Thus, the purpose of Kurosawa is destroyed and there is no reasonable expectation of success. Accordingly, claim 45 is patentably distinct over Kurosawa and Marks.

Applicant further submits that the record is not clear on the motivation to combine Kurosawa and Marks. The motivation states utilizing a material in a site between metal features for the purpose of providing an etch resistance layer within the site being etched in a subsequent removal of the material, thereby avoiding an over-etch of the semiconductor material surrounding the site. This appears to lack coherency in that the same material is in the site and the etched. There is no discussion of any material that would prevent an over-etch of semiconductor material surrounding the site. Clarification of how the material in the site can avoid over-etch of the semiconductor material surrounding the site. Moreover, the material surrounding the site between the metal elements 3 is thick oxide film, not a semiconductor material. The same can be said for Marks, which has an insulation layer 20d (Figure 11) surrounding metals 14, 15. There is no suggestion or teaching in the references for subsequent over-etching of a semiconductor material nor is there one discussed in the present claims. As such, applicant submits that there is no motivation to combine Kurosawa and Marks to render present claims 45-47 obvious.

Reconsideration and allowance of claims 45-47 are requested.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 – EXPEDITED PROCEDURE

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Filing Date: December 22, 1999

Title: USE OF A PLASMA SOURCE TO FORM A LAYER DURING THE FORMATION OF A SEMICONDUCTOR DEVICE

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (612) 349-9587 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

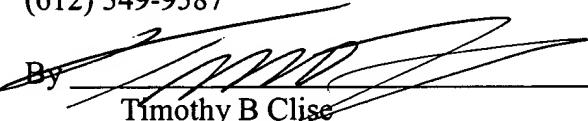
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop RCE, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 22 day of December, 2005.

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Signature

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